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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/539,775	08/05/2005	Johannes Schroeter	029368.00035	4993

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ARENT FOX LLP  
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WASHINGTON, DC 20036

EXAMINER
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OCHYLSKI, RYAN M

ART UNIT	PAPER NUMBER
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4151

NOTIFICATION DATE	DELIVERY MODE
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11/07/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

DCIPDocket@arentfox.com  
IPMatters@arentfox.com  
Patent\_Mail@arentfox.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/539,775	<b>Applicant(s)</b> SCHROETER ET AL.	
	<b>Examiner</b> RYAN OCHYLSKI	<b>Art Unit</b> 4151	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 August 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 12-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☒ Claim(s) 11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20 June 2005</u> .  | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION**

***Election/Restrictions***

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-11, drawn to a method for the plastic deformation of polymers.

Group II, claim(s) 12-15, drawn to an apparatus.

Group III, claim(s) 16-17, drawn to a polymer.

2. The inventions listed as Groups I, II, and III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Wood (WO 96/18493, already of record) teaches the common technical features of simultaneously deforming a polymer by treatment with electromagnetic radiation in the range from 0.8 to 100  $\mu\text{m}$ , pressure, shearing, and thermal energy (Page 3 Lines 15-29 and Page 6 Lines 14-21).

3. During a telephone conversation with Patricia Granados on October 28, 2008 a provisional election was made without traverse to prosecute the invention of Group I, Claims 1-11. Affirmation of this election must be made by applicant in replying to this

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Office action. Claims 12-17 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

4. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

5. The examiner has required restriction between product and process claims.

Where applicant elects claims directed to the product, and the product claims are subsequently found allowable, withdrawn process claims that depend from or otherwise require all the limitations of the allowable product claim will be considered for rejoinder. All claims directed to a nonelected process invention must require all the limitations of an allowable product claim for that process invention to be rejoined.

In the event of rejoinder, the requirement for restriction between the product claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104. Thus, to be allowable, the rejoined claims must meet all criteria for patentability including the requirements of 35 U.S.C. 101, 102, 103 and 112. Until all claims to the elected product are found allowable, an otherwise proper restriction requirement between product claims and process claims may be maintained. Withdrawn process claims that are not commensurate in scope with an allowable product claim will not be rejoined. See MPEP § 821.04(b). Additionally, in order to retain the right to rejoinder in accordance with the

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above policy, applicant is advised that the process claims should be amended during prosecution to require the limitations of the product claims. **Failure to do so may result in a loss of the right to rejoinder.** Further, note that the prohibition against double patenting rejections of 35 U.S.C. 121 does not apply where the restriction requirement is withdrawn by the examiner before the patent issues. See MPEP § 804.01. The drawings are objected to under 37 CFR 1.83(a).

### ***Claim Objections***

6. Claim 11 is objected to because of the following informalities:
7. Claim 11 Lines 5-6 should read --and is then extruded and spun to give fibers--.
8. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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11. Claims 1-2 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Wood (WO 96/18493, already of record).

10. Regarding Claim 1, Wood teaches a method for the plastic deformation of polymers, comprising treating polymers with electromagnetic radiation having a wavelength in the range from 0.8 to 100  $\mu\text{m}$  ("infra-red extending into visible light"), and simultaneously treating the polymers with pressure ("fluid pressure") and shearing ("elongate") and thermal energy ("heating the thermoplastic material") (Page 3 Lines 15-29 and Page 6 Lines 14-21). Given that visible light occupies the spectrum between about 0.38  $\mu\text{m}$  to 0.75  $\mu\text{m}$  and infrared radiation occupies the spectrum between a about 0.75  $\mu\text{m}$  to 1 mm, the only way the condition under which "infra-red extending into visible light" could be met without the infra-red wavelength being in the range from 0.8 to 100  $\mu\text{m}$  would be if the infrared radiation was contained exclusively between wavelengths of 0.75  $\mu\text{m}$  to 0.80  $\mu\text{m}$ . Such tight control of wavelength without the use of a laser is difficult to achieve. Thus, because Wood does not disclose use of a laser, "infra-red extending into visible light" is sufficiently specific for Wood's disclosed infrared radiation to be inherently in the range of 0.8 to 100  $\mu\text{m}$ .

In the alternative, if Wood's infrared radiation does fall exclusively between wavelengths of 0.75  $\mu\text{m}$  to 0.80  $\mu\text{m}$ , it would have been obvious to one having ordinary skill in the art at the time of the invention to optimize the wavelength to have a wavelength in the range from 0.8 to 100  $\mu\text{m}$  for the benefit of providing an appropriate degree of heating and softening to achieve plastic deformation of the polymer.

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11. Regarding Claim 2, Wood teaches supplying heat to the polymer (Page 3 Lines 15-19.)

***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

14. Claims 3-4 and 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wood (WO 96/18493, already of record) as applied to Claim 1 above and in view of Nordin et al. ("Note on molten cellulose produced in a laser beam" already of record).

15. Regarding Claims 3-4 and 7-10, Wood teaches the general method as applied above.

However, Wood does not teach that the electromagnetic radiation is laser radiation that has a wavelength in the range from 1 to 50  $\mu\text{m}$  and that the polymer is a

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polymer is a polysaccharide that can form intermolecular hydrogen bridge bonds such as cellulose.

In analogous art pertaining to polymer deformation, Nordin et al. teach that the polymer is cellulose treated with a laser that has a wavelength in the range from 1 to 50  $\mu\text{m}$  (Page 610 Column 1 Lines 9-20) for the benefit of melting crystalline cellulose while avoiding crosslinking and degradation reactions that destroy the useful properties of cellulose.

Crystalline cellulose is a meltable polymer and is thus an obvious substitute for the meltable polymer of Wood. Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to combine Wood with Nordin et al. for the benefit melting crystalline cellulose while avoiding crosslinking and degradation reactions that destroy the useful properties of cellulose.

16. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wood (WO 96/18493, already of record) as applied to Claim 1 above.

17. Regarding Claim 5, Wood teaches the claimed invention except for the pressure acting on the polymer being in a range from 1  $\text{N/mm}^2$  to 5000  $\text{N/mm}^2$ . It would have been obvious to one having ordinary skill in the art at the time of the invention to treat the polymer with pressure in a range from 1  $\text{N/mm}^2$  to 5000  $\text{N/mm}^2$ , since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. One would have been motivated to treat the polymer with in a range from 1  $\text{N/mm}^2$  to 5000



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N/mm<sup>2</sup> for the benefit of deforming the polymer sufficiently for molding purposes without destroying important structural features that impart key functionality to the polymer.

18. Claims 6 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wood (WO 96/18493, already of record) as applied to Claim 1 above, and in view of Gessner (US 5,270,107).

19. Regarding Claim 6, Wood teaches the general method as applied above.

However Wood does not teach that the shearing is applied with a force or torque such that a shear rate in the range from  $10^0$  to  $10^6 \text{ s}^{-1}$  acts on the polymer.

In analogous art pertaining to polymer deformation, Gessner teaches shearing applied with a force such that a shear rate in the range from  $10^0$  to  $10^6 \text{ s}^{-1}$  acts on the polymer (Column 5 Lines 46-53) for the benefit of deforming the polymer sufficiently for molding purposes without destroying important structural features that impart key functionality to the polymer.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to combine Wood with Gessner for the benefit of deforming the polymer sufficiently for molding purposes without destroying important structural features that impart key functionality to the polymer.

20. Regarding Claim 11, Wood teaches the general method as applied above.

However Wood does not teach that the melted polymer is extruded and spun to give fibers or processed by injection molding to give a molding.

In analogous art pertaining to polymer deformation, Gessner teaches that the melted polymer is extruded and spun to give fibers (Abstract) for the benefit of

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converting the original polymer into a form that enables new and different applications such as fabric manufacturing.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to combine Wood with Gessner for the benefit of converting the original polymer into a form that enables new and different applications such as fabric manufacturing.

### ***Conclusion***

21. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

22. Kurihara et al. (US 6,099,285) cite specific pressure conditions for deforming polymers.

23. Hamilton et al. (US 5,275,056) cite simultaneous pressure and shearing.

24. Vaders (US 6,579,483) cites simultaneous pressure and thermal energy.

25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to RYAN OCHYLSKI whose telephone number is (571)270-7009. The examiner can normally be reached on Monday through Thursday from 7:30-5:00 and every other Friday from 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Angela Ortiz can be reached on 571-272-1206. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

rmo

/Matthew J. Daniels/  
Primary Examiner, Art Unit 1791  
for Angela Ortiz, SPE art unit 4151